**Structures, Processes, and Responses of Plants**

**6-2 The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)**

**6.2.1 Summarize the characteristics that all organisms share (including the obtainment and use of resources for energy, the response to stimuli, the ability to reproduce, and process of physical growth and development).**
**Taxonomy level**: 2.4-B Understand Conceptual Knowledge

**Previous/Future knowledge:** In kindergarten (K-2.2), students identified examples of organisms and nonliving things. Students have explored the basic needs (food, shelter, water, space, and shelter) of plants in 1st grade and of animals in 2nd grade.

**It is essential for students to** know the characteristics that separate living organisms from non-living things. All living organisms share the following characteristics:

*They obtain and use resources for energy*
- All organisms must obtain resources, such as food, oxygen, and water, which provide required energy to perform the basic processes of life, such as growing and developing, or repairing injured parts.
- *Autotrophs* (for example plants) provide their own food for energy through the process of *photosynthesis*, while *heterotrophs* (for example animals) must find an external source for food.
- Energy is released from food in most organisms through the process of *respiration*.

*They respond to stimuli*
- A *stimulus* is any change in an organism's surroundings that will cause the organism to react.
- Examples of environmental stimuli may be changes in the amount of light present, changes in temperature, sound, amount of water, space, amounts or types of food, or other organisms present.
- The reaction to the stimulus is called a *response.* It can be an action or behavior performed by the organism.

*They reproduce*
- Organisms have the ability to reproduce, or produce offspring that have similar characteristics as the parents. There are two basic types of reproduction:
  - *Asexual reproduction*: a reproductive process that involves only one parent and produces offspring that is identical to the parent.
  - *Sexual reproduction*: a reproductive process that involves two parents. The egg (female reproductive cell) and sperm (male reproductive cell) from these two parents combine to make an offspring that is different from both parents.

*They grow and develop*
- *Growth* is the process whereby the organism becomes larger.
- *Development* is the process that occurs in the life of the organism that results in the organism becoming more complex structurally.
- Organisms require energy to grow and develop.

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**It is not essential for students to** know about the origins of life, mitosis or meiosis, or the chemical equations for photosynthesis and respiration.

**Assessment Guidelines:**
The objective of this indicator is to *summarize* characteristics that all organisms share; therefore, the primary focus of assessment should be to generalize the major points about characteristics that all organisms share. However, appropriate assessments should also require student to *recall or exemplify* the characteristics of organisms; or *compare* how organisms obtain food or reproduce.